CLAIMS

1. A blower which sucks air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the circular inner perimeter to the non-circular outer perimeter of the annular wall, being formed in sections of said annular wall which are opposite to the ends of the fan blades,

wherein said slits are formed to have a shape which allows the flow rate of air flowing inside the annular wall through said slits to be constant all around the annular wall.

2. A blower which sucks air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the circular inner perimeter to the non-circular outer perimeter of the annular wall, being formed in sections of said annular wall which are opposite to the ends of the fan blades,

wherein the flow rate of air flowing inside the annular wall through the slits is made constant all around the annular wall by continuously or intermittently changing the width of said slits, w, according to the radial length between the inner and outer perimeters of said annular wall, L, so that the condition represented by the following equation or its close condition is met:

$w^3/L = \text{constant}.$

3. A blower according to claim 2, wherein a plurality of annular plates are spaced from each other and stacked in the direction of the axis of rotation of a fan to form an annular wall with slits.

4. A blower which sucks air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the circular inner perimeter to the non-circular outer perimeter of the annular wall, being formed in sections of said annular wall which are opposite to said ends of the fan blades,

wherein the flow rate of air flowing inside the annular wall through the slits is made constant all around the annular wall by changing the width of said slits, w, and the number of slits in the direction of the axis of rotation, n (n is a positive integer), according to the radial length between the inner and outer perimeters of said annular wall, L, so that the condition represented by the following equation or its close condition is met:

$$n \cdot w^3/L = \text{constant}.$$

5. A blower which sucks air inside an annular wall (2) through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, the outer peripheral sections of said annular wall which correspond to the ends of fan blades being formed to be plane and substantially flush with a rectangular casing body at the middle of upper, lower,

right, and left sides of the body, and the slits, passing from the circular inner perimeter to said outer perimeter of the annular wall, being formed in sections of said annular wall which are opposite to the ends of the fan blades,

wherein a plurality of annular plates are spaced from each other and stacked in the direction of the axis of rotation of the fan to form said annular wall with slits, and spacers forming and supporting the slits are disposed in or near the middle of each of the four sides of the casing body.

6. A blower according to claim 5, wherein the spacers in or near the middle of the four sides of the casing body are projected outward from the annular wall.

7. A blower according to claim 6, wherein the projected section of the spacer is tapered along the axis of rotation.

8. A blower which is arranged to suck air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the inner perimeter to the outer perimeter of the annular wall at a section which corresponds to the ends of fan blades, being formed in sections of said annular wall which are opposite to the ends of fan blades,

wherein the cross-sectional shape of the fan obtained by cutting a blade through the surface of a cylinder concentric with the axis of rotation of the fan is an airfoil, and the

shape of the fan near the end of each blade is an airfoil in response to air flowing in through said slits.

9. A blower according to claim 8, wherein the blade thickness near the end of the blade is gradually reduced toward the end.

10. A blower according to claim 9, wherein the airfoil obtained by cutting the fan through the surface of a cylinder concentric with the axis of rotation is so formed that the location at which the blade thickness is maximum gradually moves toward a blade trailing edge side as the location approaches the end of the blade.

11. A blower according to claim 9, wherein the blade advance angle near the end of the blade is set larger than in other sections.

12. A blower according to claim 11, wherein the blade advance angle θ is set to satisfy the following equation:

$$\theta = \tan^{-1}(v/u)$$

where v is the average velocity of air flowing in from outside the annular wall, and u is the peripheral speed of the end of the blade.

13. A blower according to any one of claims 9 through 12, wherein the blade inclination angle near the end of the blade

is set equal to the angle of the slits provided in the annular wall.

14. A blower which is arranged to suck air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the inner perimeter to the outer perimeter of the annular wall at a section which corresponds to the ends of fan blades, being formed in sections of said annular wall which are opposite to said ends of the fan blades,

wherein said annular wall with the slits is formed by stacking a plurality of annular plates in a spaced relation from each other through spacers in the direction of the axis of rotation of the fan, and the annular plate that is located at the most upstream side of the main air flow produced by the fan rotation has the largest thickness among all the annular plates.

15. A blower according to claim 14, wherein the annular plate that is located at the most upstream side of the main air flow produced by the fan rotation is formed by cutting the upstream-side end surface of the inner perimeter so that the perimeter becomes thin.

16. A blower which is arranged to suck air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits,

passing from the inner perimeter to the outer perimeter of the annular wall at a section which corresponds to the ends of fan blades, being formed in sections of the annular wall which are opposite to said ends of fan blades,

wherein the clearance between the end of a fan blade and the inner perimeter of the annular wall becomes wider according as it gets farther away from a bearing support.

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17. A blower which is arranged to suck air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the inner perimeter to the outer perimeter of the annular wall at a section which corresponds to the ends of fan blades, being formed in sections of said annular wall which are opposite to said ends of the fan blades,

wherein the annular wall with the slits is formed by stacking a plurality of annular plates in a spaced relation from each other through spacers in the direction of the axis of rotation of the fan, and the width of said slits is larger only near said spacers than in the surroundings thereof.

18. A blower according to claim 17, wherein the thickness of a section in which the width of said slits are larger than in the surroundings thereof is equal to or smaller than the width of the surrounding slits.

19. A blower which is arranged to suck air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the inner perimeter to the outer perimeter of the annular wall at a section which corresponds to the ends of fan blades, being formed in sections of said annular wall which are opposite to said ends of the fan blades,

wherein the annular wall with the slits is formed by stacking a plurality of annular plates in a spaced relation from each other through spacers in the direction of the axis of rotation of the fan, and notches are provided near the spacers in the outer perimeter of said annular plates so as to reduce the radial length of the annular plates.

20. A blower which is arranged to suck air inside an annular wall through slits as a fan rotates, the annular wall being formed away from the ends of fan blades, and the slits, passing from the inner perimeter to the outer perimeter of the annular wall at a section which corresponds to the ends of fan blades, being formed in sections of said annular wall which are opposite to said ends of the fan blades,

wherein the annular wall with the slits is formed by stacking a plurality of annular plates in a spaced relation from each other through spacers in the direction of the axis of rotation of the fan, and at least (n-2) of the n spacers (n is an integer equal to or larger than five) are disposed in parallel with each other.

21. A blower according to claim 20, wherein among the spacers forming and supporting the slits, those spacers at and near the middle of the four sides of the casing body are inclined with respect to the radial direction.

22. A blower according to claim 20, wherein among the spacers forming and supporting the slits, those spacers in the four corners of the casing body are inclined with respect to the radial direction.

23. A blower according to any one of claims 20 through 22, wherein the outer peripheral ends of the spacers inclined with respect to the radial direction are cambered or cut obliquely.

24. A blower-housing molding method for molding a housing of the blower according to claims 21 or 22 using a pair of upper and lower molds for forming the inner surface of the annular wall and a boss to which a motor is secured, and a pair of slide cores sliding opposite to each other at right angles to the moving direction of said pair of molds,

wherein the slits all around the annular wall are formed by said pair of slide cores at a time, and the annular wall with the slits, a base serving as a reference for installing the blower and the boss are molded as a single piece respectively.